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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/998,861 | 11/01/2001 | Johan Ericson | 21882-502 | 6942 |
| 30623 | 7590 | 07/13/2004 | EXAMINER | |
| MINTZ, LEVIN, COHN, FERRIS, GLOVSKY AND POPEO, P.C. ONE FINANCIAL CENTER BOSTON, MA 02111 | | | KAUSHAL, SUMESH | |
| | | ART UNIT | PAPER NUMBER | |
| | | 1636 | | |

DATE MAILED: 07/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|----------------------|----------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 09/998,861 | ERICSON, JOHAN | |
| | Examiner | Art Unit | |
| | Sumesh Kaushal Ph.D. | 1636 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 26 April 2004.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-71 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) _____ is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) 1-71 are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: see attached Notice to Comply.

Election/Restrictions

The restriction requirement mailed on 03/24/04 has been vacated in view of new Election/Restriction requirement below:

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-24, drawn to a method of guiding the fate of differentiation of a cell into a specific cell type by contacting the cell with a Groucho-interacting protein (GIP), wherein the cells is a stem cell, classified in class 435, subclass 375.
- II. Claims 1-24, drawn to a method of guiding the fate of differentiation of a cell into a specific cell type by contacting the cell with a Groucho-interacting protein (GIP), wherein the cells is a progenitor cell, classified in class 435, subclass 375.
- III. Claims 1-24, drawn to a method of guiding the fate of differentiation of a cell into a specific cell type by contacting the cell with a Groucho-interacting protein (GIP), wherein the cells is a cell of the peripheral nervous system, classified in class 435, subclass 375.
- IV. Claims 1-24, drawn to a method of guiding the fate of differentiation of a cell into a specific cell type by contacting the cell with a Groucho-interacting protein (GIP), wherein the specific cell type into which the cell differentiate is a interneuron, classified in class 435, subclass 375.
- V. Claims 1-24, drawn to a method of guiding the fate of differentiation of a cell into a specific cell type by contacting the cell with a Groucho-interacting

protein (GIP), wherein the specific cell type into which the cell differentiate is a motor neuron, classified in class 435, subclass 375.

- VI. Claims 1-24, drawn to a method of guiding the fate of differentiation of a cell into a specific cell type by contacting the cell with a Groucho-interacting protein (GIP), wherein the specific cell type into which the cell differentiate is a dopaminergic neuron, classified in class 435, subclass 375.
- VII. Claims 1-24, drawn to a method of guiding the fate of differentiation of a cell into a specific cell type by contacting the cell with a Groucho-interacting protein (GIP), wherein the specific cell type into which the cell differentiate is a cortical neuron, classified in class 435, subclass 375.
- VIII. Claims 1-24, drawn to a method of guiding the fate of differentiation of a cell into a specific cell type by contacting the cell with a Groucho-interacting protein (GIP), wherein the specific cell type into which the cell differentiate is a gaba-ergic neuron, classified in class 435, subclass 375.
- IX. Claims 1-24, drawn to a method of guiding the fate of differentiation of a cell into a specific cell type by contacting the cell with a Groucho-interacting protein (GIP), wherein the specific cell type into which the cell differentiate is a glutaminergic neuron, classified in class 435, subclass 375.
- X. Claims 1-24, drawn to a method of guiding the fate of differentiation of a cell into a specific cell type by contacting the cell with a Groucho-interacting protein (GIP), wherein the cells is a kidney cell, classified in class 435, subclass 375.
- XI. Claims 1-24, drawn to a method of guiding the fate of differentiation of a cell into a specific cell type by contacting the cell with a Groucho-interacting

protein (GIP), wherein the cells is a heart muscle cell, classified in class 435, subclass 375.

- XII. Claims 1-24, drawn to a method of guiding the fate of differentiation of a cell into a specific cell type by contacting the cell with a Groucho-interacting protein (GIP), wherein the cells is a pancreatic cell, classified in class 435, subclass 375.
- XIII. Claims 1-24, drawn to a method of guiding the fate of differentiation of a cell into a specific cell type by contacting the cell with a Groucho-interacting protein (GIP), wherein the cells is a skin cell, classified in class 435, subclass 375.
- XIV. Claims 1-24, drawn to a method of guiding the fate of differentiation of a cell into a specific cell type by contacting the cell with a Groucho-interacting protein (GIP), wherein the cells is a liver cell, classified in class 435, subclass 375.
- XV. Claims 1-24, drawn to a method of guiding the fate of differentiation of a cell into a specific cell type by contacting the cell with a Groucho-interacting protein (GIP), wherein the cells is a white or red blood cell, classified in class 435, subclass 375.
- XVI. Claims 25-28, 42-44 and 57, drawn to an isolated polypeptide of SEQ ID NO:7 and 13, classified in class 530, subclass 350.
- XVII. Claims 29-38, drawn to an isolated DNA encoding the amino acid sequences of SEQ ID NO:7 and 13, classified in class 536, subclass 23.1.

XVIII. Claims 39-41, drawn to an antibody that binds to the amino acid sequences of SEQ ID NO:7 and 13, classified in class 530, subclass 387.1.

XIX. Claim 61, drawn to an antibody that binds to the GIP/Groucho-corepressor protein complex, classified in class 530, subclass 387.1.

XX. Claims 45-54, drawn to a purified GIP/Groucho-corepressor protein complex, classified in class 530, subclass 350.

XXI. Claims 55-60, drawn to a chimeric polypeptide comprising a portion of GIP and a portion of Groucho-corepressor, classified in class 435, subclass 69.1.

XXII. Claims 62-63, 69-70, drawn to a kit comprising antibodies specific to GIP, Groucho-corepressor and GIP/Groucho-corepressor-complex and method of diagnosing the proteins or complex classified in class 435, subclass 7.1

XXIII. Claims 64-68, 71 drawn to a method of identifying agents that modulates, disrupt, or interact with the GIP/Groucho-corepressor-complex, and treating a disease involving altered levels of GIP/Groucho-corepressor-complex classified in class 435, subclass 4 and class 514, subclass 2.

In order to be perfectly clear, the following Inventions within the particular Groups are NOT species elections. These are independent and distinct Inventions for the reasons given below and a further election of a single Invention from the elected Group is required.

With regard to Groups I-XV and XX the independent and distinct Inventions are as follows (Groucho-corepressor protein):

- A. *Grg1*
- B. *Grg2*

- C. *Grg3*
- D. *Grg4*

With regard to Groups I-XV and XX the independent and distinct Inventions are as follows (Groucho-interacting protein):

- a) Wherein the Groucho-interacting protein (GIP) comprises class I homeodomain polypeptide (Pax).
- b) Wherein the Groucho-interacting protein (GIP) comprises class I homeodomain polypeptide (Dbx).
- c) Wherein the Groucho-interacting protein (GIP) comprises class I homeodomain polypeptide (Irx).
- d) Wherein the Groucho-interacting protein (GIP) comprises class II homeodomain polypeptide selected from Nkx-family.
 - a. *Nkx2.2*
 - b. *Nkx2.9*
 - c. *Nkx6.1*
 - d. *Nkx6.2*
 - e. *Nkx6.3*

The inventions are distinct, each from the other because of the following reasons:

Inventions I-XV are distinct. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case method of guiding the fate of differentiation of a stem cell, a progenitor cell, a cell of the peripheral nervous system, an interneuron, a motor neuron, a dopaminergic neuron, a cortical neuron, a gaba-ergic neuron, a glutaminergic neuron, a kidney cell, a heart muscle cell, a pancreatic cell, a skin cell, a liver cell, and a white or red blood cell by contacting the cell a GIP is distinct from each other, since each cell type is structurally and functionally distinct. In addition upon differentiation of each cell

type have different phenotypes, perform different functions and elicits different effects in-vivo or in -vitro. Thus these inventions are distinct and are of separate uses, since use of one is not required for another.

Inventions A-D are distinct. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In instant case Groucho corepressor protein represented by Grg1, Grg2, Grg3 and Grg4 each have different structure and function. In addition these Grg proteins are expressed in different parts during neuronal development wherein each a play a functionally distinct role in the differentiation of cells in response to corresponding homeodomain proteins. Thus these inventions are distinct and are of separate uses, since use of one is not required for another.

Inventions a)-e) are distinct. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In instant case a Groucho-interacting protein, which comprises a class I homeodomain polypeptide (Pax, Dbx, Irx) and class II homeodomain polypeptide Nkx-family are structurally and functionally distinct polypeptides that modulates cell differentiation via different modes of operation (i.e. differential regulation of Shh-signaling). In addition Nkx6.1, Nkx6.2, Nkx6.3 and Nkx2.2 each are structurally and functional distinct gene products, which are known to play differential role during cell specific differentiation by interacting to various Groucho corepressor proteins. Furthermore, homeodomain polypeptides regulate the fate of cell differentiation, which is not only tissue specific but also depends upon cellular subtypes. Thus these inventions are distinct and are of separate uses use, since use of one is not required for another.

Inventions XVI (GIP protein), XVII (GIP DNA), XVIII (GIP ab), XIX (ab to complex) XX (GIP/Groucho-corepressor-complex) and XXI (GIP/Groucho-corepressor fusion protein) are distinct. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant

case proteins, nucleic acid molecules, proteins, and antibodies are structurally and functionally distinct product. For example, proteins and antibodies are biologically active compounds wherein the nucleic acids require an expression vector to express the encoded product. In addition proteins could also be isolated from natural sources besides making them by recombinant means (see (MPEP § 806.05(f)). Thus these inventions are distinct and are of separate uses.

Inventions XXII and XXIII are distinct. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In instant case a kit and its use to detect GIP/Groucho-corepressor-complex requires materially different reagents and protocols as compare to method of identifying agents that modulates GIP/Groucho-corepressor-complex stability or activity. In addition the agents that modulates the stability or activity of GIP/Groucho-corepressor-complex are not required for the diagnosis of GIP or Groucho-corepressor polypeptides or GIP/Groucho-corepressor-complex. Thus these inventions are distinct and are of separate uses.

Inventions I-XV and XVI are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case besides guiding the fate of neuronal differentiation the GIP polypeptide could also be used to generate GIP specific antibodies. Thus these inventions are distinct and are of separate uses.

Inventions of groups I-XV are distinct from inventions of groups XVII-XXII. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In instant case use of invention XVII (GIP DNA), XVIII (GIP ab), XIX (ab to complex) XX (GIP/Groucho-corepressor-complex) or XXI (GIP/Groucho-corepressor fusion protein) are not required for the inventions of

groups I-XV. Invention of groups I-XV only requires the use of GIP protein to stimulate cells. Thus these inventions are distinct and are of separate uses.

Invention XXII is distinct from inventions of groups XVIII and XIX. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case besides making a diagnostic kit the antibodies of invention XVIII and XIX could also be used to affinity columns for protein purification. Thus these inventions are distinct and are of separate uses.

Invention XXIII is distinct from inventions of group XX. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case besides screening the compounds that modulates GIP/Groucho-corepressor-complex activity the complex could also be used to raise antibodies against the GIP/Groucho-corepressor-complex. Thus these inventions are distinct and are of separate uses.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

Applicant is advised that the reply to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim

remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

The examiner has required restriction between product and process claims. Where applicant elects claims directed to the product, and a product claim is subsequently found allowable, withdrawn process claims that depend from or otherwise include all the limitations of the allowable product claim will be rejoined in accordance with the provisions of MPEP § 821.04. Process claims that depend from or otherwise include all the limitations of the patentable product will be entered as a matter of right if the amendment is presented prior to final rejection or allowance, whichever is earlier. Amendments submitted after final rejection are governed by 37 CFR 1.116; amendments submitted after allowance are governed by 37 CFR 1.312.

In the event of rejoinder, the requirement for restriction between the product claims and the rejoined process claims will be withdrawn, and the rejoined process claims will be fully examined for patentability in accordance with 37 CFR 1.104. Thus, to be allowable, the rejoined claims must meet all criteria for patentability including the requirements of 35 U.S.C. 101, 102, 103, and 112. Until an elected product claim is found allowable, an otherwise proper restriction requirement between product claims and process claims may be maintained. Withdrawn process claims that are not commensurate in scope with an allowed product claim will not be rejoined. See "Guidance on Treatment of Product and Process Claims in light of *In re Ochiai, In re Brouwer* and 35 U.S.C. § 103(b)," 1184 O.G. 86 (March 26, 1996). Additionally, in order to retain the right to rejoinder in accordance with the above policy, Applicant is advised that the process claims should be amended during prosecution either to maintain dependency on the product claims or to otherwise include the limitations of the product claims. Failure to do so may result in a loss of the right to rejoinder. Further, note that the prohibition against double patenting rejections of 35 U.S.C. 121 does not apply where the restriction requirement is withdrawn by the examiner before the patent issues. See MPEP § 804.01.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sumesh Kaushal Ph.D. whose telephone number is

571-272-0769. The examiner can normally be reached on Mon-Fri. from 9AM-5PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yucel Irem Ph.D. can be reached on 571-272-0781.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to (571) 272-0547.

Patent applicants with problems or questions regarding electronic images that can be viewed in the Patent Application Information Retrieval system (PAIR) can now contact the USPTO's Patent Electronic Business Center (Patent EBC) for assistance. Representatives are available to answer your questions daily from 6 am to midnight (EST). The toll free number is (866) 217-9197. When calling please have your application serial or patent number, the type of document you are having an image problem with, the number of pages and the specific nature of the problem. The Patent Electronic Business Center will notify applicants of the resolution of the problem within 5-7 business days. Applicants can also check PAIR to confirm that the problem has been corrected. The USPTO's Patent Electronic Business Center is a complete service center supporting all patent business on the Internet. The USPTO's PAIR system provides Internet-based access to patent application status and history information. It also enables applicants to view the scanned images of their own application file folder(s) as well as general patent information available to the public.

For all other customer support, please call the USPTO Call Center (UCC) at 800-786-9199. The fax phone number for the organization where this application or proceeding is assigned is **703-872-9306**.

Sumesh Kaushal
Examiner Art Unit 1636



SUMESH KAUSHAL
PATENT EXAMINER